

I claim:

1. A prosthetic intervertebral disc comprising:

a) a central core material having an upper surface, a lower surface and a sidewall therebetween, and

5 b) a non-resorbable outer shell having an inner surface surrounding the central core and contacting the upper surface, the lower surface and the sidewall of the core.

2. The disc of claim 1 wherein the non-resorbable shell has an outer surface, the
10 outer surface having an i) upper surface adapted to contact a natural upper vertebral endplate and ii) a lower surface adapted to contact a natural lower vertebral endplate.

3. The disc of claim 2 wherein the upper surface of the shell is convex, and the lower surface of the shell is flat or concave.

15 4. The disc of claim 2 wherein the upper and lower surfaces of the shell are convex.

5. The disc of claim 1 wherein the outer shell further comprises an upper wall having a lower thickness, and a side wall having a larger thickness.

20 6. The disc of claim 5 wherein the larger thickness of the sidewall approximates a thickness of the annulus fibrosus.

7. The disc of claim 1 further comprising:
25 c) an intermediate layer between the central core and the outer shell.

8. The disc of claim 1 having no intermediate layer between the core and the outer shell.

30 9. The disc of claim 1 further comprises:
c) a radio-opaque marker disposed within the outer shell or core.

10. The disc of claim 1 wherein the outer shell has an upper wall having an outer surface having a dry coefficient of friction against bone of at least 0.5.(*high COF*)
- 5 11. The disc of claim 1 wherein the outer shell has a high hardness and the core has a lower hardness.
12. A prosthetic intervertebral disc comprising:
- 10 a. a central core material,
- b. a non-resorbable outer shell surrounding the central core, the outer shell having an upper wall having an upper outer surface,
- wherein the upper surface of the upper wall of the outer shell has a dry coefficient of friction against bone of at least 0.5.
- 15 13. The disc of claim 12 wherein the outer surface of the upper wall of the outer shell has a surface roughness R_{\max} of no more than 0.15mm.
14. The disc of claim 12 wherein the upper surface of the shell is convex, and the lower surface of the shell is flat or concave.
- 20 15. The disc of claim 12 wherein the upper and lower surfaces of the shell are convex.
16. The disc of claim 12 wherein the outer shell comprises silicone.
- 25 17. The disc of claim 12 wherein the outer shell further comprises a lower wall having a lower surface, the lower surface having a dry coefficient of friction against bone of at least 0.5.
- 30 18. The disc of claim 12 wherein at least one of the upper and lower surfaces of the outer shell comprises a recess for receiving a pin.

19. The disc of claim 18 wherein the lower surface of the outer shell comprises a recess for receiving a pin.
- 5 20. The disc of claim 12 wherein wherein at least one of the upper and lower surfaces of the shell is flat.
21. A prosthetic intervertebral disc comprising:
- 10 a) a central core material, and
- b) an outer shell having a sidewall surrounding the core, wherein the sidewall of the outer shell has a hardness of more than 80 Shore A.
22. The disc of claim 21 wherein the central core and the outer shell are made of different grades of the same material.
- 15 23. The disc of claim 22 wherein the same material is silicon.
24. The disc of claim 21 wherein the central core has a higher hardness and the sidewall of the outer shell has a lower hardness.
- 20 25. The disc of claim 21 wherein the hardness of the sidewall of the outer shell is between more than 80 Shore A and 100 Shore A.
26. The disc of claim 21 wherein the outer shell further comprises upper and lower
- 25 walls surrounding the core, wherein the upper and lower walls of the outer shell have a hardness of more than 80 Shore A.
27. The disc of claim 21 wherein the hardness of the outer shell is between 85 Shore A and 95 Shore A.

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28. The disc of claim 21 wherein the outer shell further comprises an upper wall having a lower thickness, and a side wall having a larger thickness.

29. The disc of claim 21 wherein the larger thickness of the sidewall approximates a
5 thickness of the annulus fibrosus.